

## **RP0903 - OPERATE VEHICLE ON ROAD**

**PURPOSE.** The next period of instruction will be Operate a Vehicle. The purpose of this class is to provide instruction on how to operate the vehicle on road, off road, and under unusual conditions and to prepare the vehicle for passengers and cargos. This class with the remaining classes and road time will prepare you to be tested and licensed on the HMMWV.

### **LEARNING OBJECTIVES:**

#### **a. TERMINAL LEARNING OBJECTIVES:**

- (1) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), operate vehicle in unusual conditions, per information contained in the references. (RP00.09.02)
- (2) Provided with an operation M series Vehicle and references operate M series vehicle on road to safely meet operational requirements with no injury to personnel or damage to equipment, per student handout. (RP00.09.03)
- (3) Provided with an operation M series vehicle and references, operate M series vehicle off road to safely meet operational requirements with no injury to personnel or damage to equipment, per the references.(RP00.09.04)
- (4) Provided with cargo to be loaded and M series vehicle or equipment and references, ensure cargo is properly loaded, to safely meet operational requirements with no injury to personnel or damage to equipment, per the references. (RP00.09.11)
- (5) Provided with an operational M series vehicle, required tools and equipment, and references, perform preventive maintenance checks and services on M series vehicles, to maintain operability and identify corrective maintenance actions, per the references. (RP00.09.12)

#### **b. ENABLING LEARNING OBJECTIVES:**

- (1) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), operate the vehicle in unusual conditions, per information contained in the references. (RP00.09.02a)
- (2) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), operate the vehicle on improved roads, per information contained in the references. (RP00.09.03a)
- (3) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), prepare vehicle for operations, per information contained in the references. (RP00.09.03b)
- (4) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), place vehicle in motion for forward or reverse operations, per information contained in the references. (RP00.09.03c)

- (5) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), operate the vehicle over a prepared driver skill course, per information contained in the references. (RP00.09.03d)
- (6) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), comply with traffic regulations, per information contained in the references. (RP00.09.03e)
- (7) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), park the vehicle and properly secure it, per information contained in the references. (RP00.09.03f)
- (8) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), operate the vehicle on unimproved roads, per information contained in the references. (RP00.09.04a)
- (9) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), prepare vehicle for cargo per information contained in the references. (RP00.09.11a)
- (10) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), properly load cargo, per information contained in the references. (RP00.09.11b)
- (11) Given a M1123, TM 2320-10/6B, FM 21-305, and a Vehicle and Equipment Operational Record (NAVMC 10627), prepare vehicle for passengers, per information contained in the references. (RP00.09.11c)
- (12) Given a M1123, TM 2320-10/6B and LO 9-2320-280-12, and a Vehicle and Equipment Operational Record (NAVMC 10627), all required tools and supplies, perform "Before Operation" preventive maintenance checks and services (PMCS) on the vehicle, per information contained in the references,. (RP00.09.12a)
- (13) Given a M1123, TM 2320-10/6B and LO 9-2320-280-12, and a Vehicle and Equipment Operational Record (NAVMC 10627), all required tools and supplies, perform "During Operation" preventive maintenance checks and services (PMCS) on the vehicle, per information contained in the references. (RP00.09.12b)
- (14) Given a M1123, TM 2320-10/6B and LO 9-2320-280-12, and a Vehicle and Equipment Operational Record (NAVMC 10627), all required tools and supplies, perform "After Operation" preventive maintenance checks and services (PMCS) on the vehicle, per information contained in the references. (RP00.09.12c)

## OPERATE THE M1123

### a. Prepare the Vehicle for Operation

- (1) Set the parking brake (if it is not already set). (Remember the M998/M1038 transmission does not have a "PARK" position).
- (2) Adjust the driver's seat to a comfortable position. To move the seat, lift it up and move it forward or rearward so the seat mount pins are positioned in the desired slot.
- (3) Adjust the mirrors.

(4) Buckle the seat belt. Ensure all the slack is removed from the seat belt adjusting strap. The seat belts retract but do not lock in any position. Injury to personnel could result if an accident occurs and the seat belt is not used or adjusted properly.

(5) Ensure the transmission shift lever is in the "P" (park) position for the M1123 and "N" (neutral) position for the M998/M1038, also insure the transfer case lever is in "H" (high range).

(6) Start the engine.

(a) Turn the rotary switch to the "RUN" position and wait until the "WAIT-TO-START" light goes out. Remember; do not attempt to start the engine while the "WAIT-TO-START" lamp is on.

(b) When the light goes out:

1 Turn the rotary switch to "START." As soon as the engine starts, release the switch lever and it will return to the "RUN" position.

2 Do not operate the starter continuously for more than twenty seconds. Leave the switch in the "RUN" position and wait ten to fifteen seconds between periods of starter operation. Failure to do this could damage the starter and glow plugs.

(7) Turn the light switch to "SERVICE DRIVE."

(8) Check the instruments while allowing the engine to warm up for approximately one minute.

(a) The oil pressure gage should register 10 psi (M1123) or 15 psi (M998/M1038) with the engine at idle.

(b) The voltmeter should register in the green area.

(c) The fuel gage should indicate the fuel level in the fuel tank.

(d) The yellow indicator in the air restrictions gage should not register within the red zone.

(9) Immediately stop the engine if any of the following conditions occur:

(a) If excessive engine vibration occurs.

(b) If the oil pressure does not register or suddenly drops to below approximately 6 psi with the engine at idle.

(c) If the air restriction gage is within the red zone.

(d) If the coolant temperature gage suddenly increases beyond approximately 230 degrees Fahrenheit.

(10) If engine overheating occurs:

(a) Park the vehicle and allow the engine to idle.

(b) Observe the coolant temperature gage for steady cooling.

(c) If the engine coolant temperature gage continues to increase or does not decrease, shut down the engine.

(d) Allow the engine to cool down and check for low coolant level. Add coolant as necessary.

(e) Check to see if the radiator fan is running.

(f) If the radiator fan is not running:

1 Disconnect the two wire connector on the time delay module from the control valve connector. This is located under the hood on the left side of the vehicle, next to the windshield washer reservoir.

2 Start the engine and check the fan for continuous operation.

3 If the fan does not operate continuously, stop the engine and notify organizational maintenance.

b. Operate the Vehicle Forward. These procedures will be used to operate the vehicle forward in good weather on high traction surfaces where little or no wheel slippage is evident:

(1) Depress the service brake pedal.

(2) Ensure the transfer case shift lever is in the "H" (high range) position. Remember, the transmission must be in neutral before shifting the transfer.

(a) Do not operate the vehicle with the transfer case in "L" (low range) or "H/L" (high lock range) on high traction surfaces with no wheel slippage or when encountering sharp continuous curves.

(b) Damage to the power train can result if you do.

(3) Place the transmission shift lever in "(D)" (overdrive) M1123 or "D" (drive) M998/M1038 for normal driving.

(4) Release the parking brake.

(5) Release the service brake and depress the accelerator pedal.

Accelerate at a safe, steady speed to get the vehicle moving and to maintain a desired speed.

(6) Should you be required to up shift or downshift, do not place your hand or thumb on top of the reverse shift button during those shifts. You could accidentally shift into reverse, causing severe damage to the transmission and injury to yourself.

(7) Operators are reminded to observe basic safe driving techniques and skills when operating this vehicle, especially when transporting personnel.

(a) Rollover protection is provided for the crew area only and is not provided in the troop and cargo area.

(b) The vehicle speed must be reduced consistent with weather and road or terrain conditions.

(c) Obstacles such as stumps and boulders must be avoided.

(d) Although certain design characteristics of the vehicle such as the vehicle width, ground clearance and independent suspension provide improved capabilities, accidents can still happen which could result in injury or death to personnel and damage to the vehicle.

c. Stop the Vehicle. To stop the vehicle:

- (1) Release the accelerator.
- (2) Gradually depress the service brake pedal and bring the vehicle to a gradual stop.

d. Operate the Vehicle in Reverse. To operate the vehicle in reverse:

- (1) Have another person be a ground guide to direct as the vehicle is backed.
- (2) Place the transmission in "P" park (M1123) or "N" neutral for the (M998/1038) and set the hand brake.
- (3) Review hand and arm signals with ground guide per reference.
- (4) Physically perform a walk around of the vehicle to ensure there are not any obstacles or personnel behind the vehicle.
- (5) Place the transmission shift lever in "R" (reverse) by first shifting to neutral then depress the reverse shift button and shift to reverse.
- (6) Release the service brake pedal.
- (7) Sound the vehicle's horn to alert anyone in the vicinity that you intend to back the vehicle.
- (8) Accelerate at a slow speed to get the vehicle moving and maintain the desired speed.

e. Park the Vehicle and Shut Down the Engine. To park the vehicle and shut down the engine:

- (1) Release the accelerator pedal.
- (2) Depress the service brake pedal and bring the vehicle to a gradual stop.
- (3) Move the transmission shift lever to "P" (park) M1123 or "N" (neutral) M998/M1038.
- (4) Set the parking brake. Remember, the M998/M1038 vehicle does not have a "PARK" position in the automatic transmission. Whenever the vehicle is parked or the transmission is in "NEUTRAL", the parking brake must be applied. Damage to the vehicle or injury to personnel may occur if the parking brake is not set.
- (5) Turn the light switch to "OFF."
- (6) Turn the rotary switch to "ENG STOP."
- (7) Lock the steering wheel with the cable and chock the wheels if the tactical situation permits. This may or may not be the policy of your motor transport unit.

## OPERATE THE M1123 UNDER UNUSUAL CONDITIONS

a. General Rules. Driving off-road or over rough terrain basically requires using good driving sense. Experience is the best teacher, but there are a few good rules you can keep in mind that will help you when driving under these conditions.

- (1) Select the proper transmission and transfer case ranges. "(D)" (overdrive) and "H" (high range) is used for most situations.
  - (a) Do not shift into any lower gear than is necessary to maintain headway.
  - (b) Use "H/L" (high lock range) or "L" (low range) only when absolutely required by the terrain, weather or road conditions.
  - (c) On steep grades with hard surfaces and good traction, before you start up the hill, shift the transfer case to "L" (low range) and the transmission to "D" (drive), "2" (second) or "1" (first), depending on the steepness of the grade.
- (2) Keep the engine operating at a constant, moderate speed for best performance.
  - (a) The engine works best in the mid-rpm range. Maximum torque is attained at 2000 rpm.
  - (b) You can slow down or speed up quickly without changing gears if you get in a tight spot.
  - (c) Use the transmission and transfer case to help control the engine speed.
- (3) Attempt to keep the vehicle's wheels from spinning. If the wheels start to spin, ease off the accelerator until traction is regained.

b. Steep Terrain Driving Techniques

- (1) Climbing steep grades
  - (a) Most of us were taught the best way to get up a steep grade with poor traction is to get a run at it. However, with the HMMWV, speed should never be a factor for climbing any hill. If this method is used with the vehicle and it gets half way up the hill when it becomes apparent that it can't continue on, this has created a couple of problems. First, the engine has been over revved causing undue stress on the engine and power train. Remember the maximum torque is reached at 2000 rpm. Second, there is a safety problem with trying to get the vehicle the rest of the way up or getting it safely back down. How is the HMMWV operated so this situation does not exist?
  - (b) Brake and acceleration modulation. Brake modulation occurs when you apply light pressure to the brake pedal at the same time you are depressing the accelerator.
  - (c) Torque-biasing differential. The HMMWV is equipped with torque biasing differentials. You may be familiar with the limited-slip or posi-traction differentials that are so highly regarded in commercial vehicles. The torque biasing differential is designed along these lines but does more to supply power to the wheel that needs it the most, the one that has traction. To simplify this and connect it with brake modulation, let's look at what happens with a conventional differential.

1 When one or more wheels loose traction and begin to spin freely, the differential has applied its torque to the area loosing traction, or the one creating the least resistance.

2 We need to redirect this torque to the wheels that are on solid ground and have traction so they can help us move the vehicle.

3 This is where brake and accelerator modulation comes into play. By applying slight pressure on the brake pedal while at the same time pressing on the accelerator, we stop the free spinning wheel. This causes the torque-biasing differential to send equal torque to the other side of the vehicle and the wheels that have traction will move the vehicle along.

4 Now if we look at this same hill we talked about earlier and started up at a slow, steady speed, we can use brake and accelerator modulation to keep us moving if we lose traction on one or more wheels.

5 Remember, slight pressure on the brake pedal and steady acceleration will move the vehicle through most places that are desired to go with the HMMWV.

6 This procedure would be used if you were climbing a hill, operating over obstacles such as gullies, logs or walls or simply negotiating muddy terrain.

(2) Descending a steep hill.

(a) You can safely descend any hill that you can climb by shifting the transfer case into "L" (low) and the transmission into "2" (second) or "1" (first) gear, depending on the steepness of the grade.

(b) Remember this vehicle is in constant four-wheel drive and when the transfer case and transmission are placed in the lower gears; all four wheels are working against engine compression to create a braking effect.

(c) Do not use the brakes. Let the engine's torque do the work.

(3) Cross slope travel.

(a) Do not travel diagonally across a slope unless it is absolutely necessary, or injury to personnel or damage to equipment may result.

(b) If you must move across the slope, choose the least angle possible, keep the vehicle moving and avoid turning the vehicle quickly.

c. Run Flat Operations. The M1123 and M998 series vehicles are equipped with run flat devices in the tires that allow the vehicle to be driven with one or two flat tires. Remember, these were discussed and demonstrated during the tire maintenance class.

(1) The vehicle can be driven a maximum of thirty miles with either one or two flat tires, regardless of the location of the flat tires on the vehicle. However, the speed at which you can drive the vehicle varies depending on which tires are flat.

(a) If both rear tires are flat, the maximum speed is twenty mph.

(b) For any other combination of two flat tires, the maximum run flat speed is thirty mph.

(2) A wheel that has been run flat must be replaced and inspected by organizational maintenance as soon as possible before reuse or damage to equipment may result.

d. Operating in Cold Weather, On Ice, or Snow. When operating in cold weather, at no time will starting aids or starting fluids be used on this engine.

(1) When starting the engine, if it cranks slowly and the voltmeter indicates a low battery charge level, you may have to use the slave starting procedures discussed earlier.

(2) Do not fully apply the hand throttle. After the engine starts, pull out the hand throttle to increase the engine speed to a high idle only. Over revving a cold engine could cause extensive internal damage to the engine.

(3) After the engine has been warmed up sufficiently, shift the transfer to "H/L" (high lock) then shift the transmission to "D" (drive). Place the vehicle in motion slowly to prevent the wheels from spinning.

(4) If the vehicle is mired in snow, place the transfer in "L" (low range) and the transmission in "1" (first). After the vehicle is free of the mired condition, stop the vehicle and return the transfer to the "H/L" (high lock) position.

(5) Vehicle operation in snow is hazardous. You must travel at reduced speeds and be prepared to meet sudden changes in road and traffic conditions. Increased distance between vehicles is a must to maintain safe stopping distances.

(6) Pump the brakes gradually when stopping the vehicle on ice or snow. Any sudden braking will cause the wheels to lock and the vehicle will slide out of control.

(7) If rear skidding occurs, let up on the accelerator pedal and turn the steering wheel in the direction of the skid until you regain control. Apply the brake pedal in a gradual pumping manner if you must stop.

e. Operating in Dusty, Sandy Areas. When operating in dusty, sandy areas for extended periods of time, vehicle maintenance becomes much more important. The air filter and cooling system must be checked and serviced more frequently.

(1) The tire inflation can be reduced to 12 psi front and 16 psi in the rear to give your vehicle more traction with less digging into the sand. This is usually referred to as floatation, meaning the tire spreads out and covers a larger area on the ground when pressure is reduced, giving the vehicle greater stability on soft sand.

(2) When operating in loose sand or soft ground, shift the transfer to "H/L" (high lock) range position and the transmission to "D" (drive) position.

(3) If the vehicle becomes mired in loose sand, stop and shift the transfer to "L" (low range) and the transmission to "1" (first) to give you the added power and traction to pull out. After the vehicle is free, stop and return the transfer to "H/L" position and the transmission to "D" (drive) position.

(4) If you cannot free the vehicle, do not attempt to "rock" the vehicle with quick transmission changes, you will only cause damage to the transmission. Use a wrecker or a second vehicle with a winch to free the vehicle.



(5) Accelerate slowly so the tires won't spin and dig into the sand. After the vehicle is moving, maintain a steady even rate of movement and avoid any unnecessary shifting of gears. Normally, the maximum safe speed that you can operate at in sandy conditions will dictate that you operate in second gear.

(6) Make wide turns to keep the front tires from digging in. Sharp turns could stall the engine, or even worse, turn the vehicle over.

(7) When stopping in sand, permit the vehicle to roll to a stop if practical; otherwise, brake gradually. This prevents the tires from digging in and sand buildup in front of the tires. Try to stop on a down slope to give you an advantage when starting out again.

(8) After operating in sand, inflate the tires to normal tire pressure and replace any missing valve caps.

(9) Clean the engine compartment and components with low pressure compressed air. Be careful to clean all sand from around the fuel tank cap and all oil and hydraulic filler caps.

f. Operating in Muddy Conditions. Operating on muddy roads or in deep mud requires some special cautions also.

(1) Before operating in mud, shift the transfer to "H/L" and the transmission to "D" (drive).

(2) If you approach an area you think you will need additional traction and power to proceed, stop the vehicle, shift the transfer to "L" (low range) and shift the transmission to "1" (first). Immediately after leaving the critical area, stop and place the transfer back into "H/L" and the transmission in "D".

(3) Approach large, water-filled chuck holes with caution. It is hard to determine the depth of the holes and the vehicle may become mired or damaged. The slower more methodically this vehicle is driven, the better it performs, especially in difficult terrain.

(4) Be alert at all times to the engine and vehicle speed. Be prepared to stop, shift the transmission and transfer to help negotiate a particularly difficult section of road. Do not operate the vehicle at speeds too great for road conditions.

(5) When operating in deep muddy ruts, if the vehicle's forward progress stops, immediately back up far enough to regain the vehicle's forward momentum and continue until clear of the difficult area.

(6) When stopping the vehicle on wet slippery ground, apply the brakes gradually to avoid the possibility of the wheel brakes locking and causing skidding and a loss of control of the vehicle.

(7) Do not attempt to free the vehicle when it is mired by repeatedly shifting the transmission from forward to reverse or rocking the vehicle. This will only damage the drive train.

(8) After operating in deep muddy conditions, the vehicle must be washed and serviced as soon as possible with "LOW" pressure water only. Important points are:

(a) Radiator and oil cooler. Using low water pressure, clean the mud and debris from between the radiator and oil cooler,

- (b) Steering linkages, ball joint, and propeller shafts,
- (c) Brake rotors, pads, linkages, and parking brake linkages,
- (d) Transmission, transfer, and accelerator linkages,
- (e) Sway bar bushings and geared hubs,
- (f) Drain hole in the bottom of the transmission converter housing,
- (g) Battery box drain holes, and lastly,
- (h) Lubricate and check all fluid levels.

g. Operation in Extreme Heat. Extreme heat exists when outside temperatures reach 90 degrees Fahrenheit or more. Extreme heat affects the efficiency of the vehicle engine and is considered to be the most damaging condition for the vehicle.

(1) Perform all "Before" operation PMCS and be sure all fluid levels are full.

(2) Carefully check for insects, debris, or dirt between the radiator and oil cooler. Blow out any obstruction with low pressure compressed air and water.

(3) Carefully check all engine drive belts. Do not operate a vehicle with questionable drive belts, especially in extreme heat.

(4) Check tire pressures and adjust the pressures when the tires are cool. Tires generate a tremendous amount of heat during extreme temperatures and pressures will increase significantly.

(5) Do not operate the vehicle at high speeds for continuous periods.

(6) Try to avoid operating the vehicle on long hard pulls on steep grades in low gear.

(7) Frequently check the air cleaner indicator. If there is any red showing, stop the vehicle, shut down the engine and perform the emergency service as outlined on page 3-16 in your TM. Operators will perform this service under emergency conditions only.

(8) Continuously monitor the engine coolant temperature gage and the engine oil pressure gage. The engine or transmission is overheating if one or more of the following conditions exist:

(a) Engine coolant temperature is more than 230°F,

(b) Engine oil pressure drops below 10 psi for the M1123 and 15 psi for the M998/1038 with the engine at idle or 55 psi when the vehicle is under full load,

(9) If the engine is overheating, stop the vehicle and allow the engine to idle. Do not raise the hood; the engine will cool faster at idle with the hood closed by pulling air through the radiator fins.

(10) Continue to monitor the gages. If the engine temperature continues to rise or does not show signs of cooling after two minutes of idling, shut down the engine. Raise the hood and disconnect the time delay module connector from the control valve connector. Restart the engine and check ensure the fan is operating continuously.

(11) After the engine has cooled to normal operating temperature, check the engine and transmission fluid levels.

(12) Use extreme caution when checking the engine coolant level. Place a thick cloth over the surge tank cap and carefully turn the cap counterclockwise to the first stop to allow the pressure to escape.

(13) Remove the cap when the pressure is completely released and check the coolant level. Refill the surge tank to the hot full line.

(14) Restart the engine and continue with your operation if no further signs of overheating occur.

(15) After completing the day's mission, park in a sheltered area, if possible, and check the battery level. Check each cell and refill as needed. Water will evaporate from the batteries quickly when operating in extremely hot conditions.

## PREPARATION OF THE M1123 FOR CARGO OR PASSENGERS

The distribution of cargo definitely bears on the life of the tires, axles, frame and other vehicle parts along with safety of the vehicle. Although a vehicle may not be overloaded beyond its weight capacity, individual tires and axles may still be overloaded due to faulty cargo distribution.

### a. Preparation of the M1123 for Cargo

(1) Lowering the tailgate. The tailgate is secured in the raised position by hooks on the end of the tailgate chains on each side. To lower the tailgate, simply remove the hooks through the tailgate and brackets and lower the tailgate. Do not allow the tailgate to fall free.

(2) The troop seats must be in the raised or stowed position when loading cargo. To raise the troop seats, first remove two lock pins, one on each end where the seat joins the side racks. Raise the troop seat up and reinstall the lock pins to secure the troop seat in the raised position.

### b. Loading Cargo on the M1123

(1) As an operator you must know the maximum weight capacity of the vehicle. This can be found in the technical manual and on the vehicle data plate.

(2) The operator is responsible for the load from origin to destination to include security en-route.

(3) Responsibilities of the Operator:

(a) Ensure the vehicle is loaded properly and cargo is distributed evenly.

(b) The dimension of the cargo can be determined by the shipping papers and measuring to ensure the vehicle is not over loaded.

(c) The load is secured properly with rope, straps or chains.

1 The M1123 is equipped with 8 cargo tie down rings in the cargo bed. The tie down rings has a rated capacity of 500 pounds each.

2 When loading and tying down loads, loosen the tie down anchor bolt, turn the tie down ring so the center of the ring is in line with the direction of the pull on the lashing rope and retighten the tie down bolts.

3 The M1123 is capable of transporting 4400 pounds of cargo and care must be taken to distribute the load evenly in the bed of the vehicle.

4 If cargo longer than the bed must be carried, the tailgate can be hooked to the chains to extend the length of the bed. Ensure the weight does not overload the tailgate or extend more than 2 feet past the end of the cargo bed.

- (d) The load is covered or tarped as necessary.
- (e) The vehicle is not over loaded.
- (f) Ensure and not stack heavy cargo too high. This will cause the vehicle to be “top Heavy” and the chances of a roll over are increased.
- (g) Hazardous material items are not transported unless the operator is qualified.

1 Hazardous material includes ammunition, chemicals, flammables such as fuel and oil, and other hazardous materials identified by labels or tags with warnings and cautions.

2 Only qualified, trained operators of hazardous material are allowed to transport these items and must have the endorsement on their OF 346 with physical card.

c. Preparation of the M1123 for Troops. Although the preparation of the vehicle for hauling troops is not too difficult, many safety factors must be taken into consideration.

(1) The M1123 can seat eight passengers in the cargo bed. The troop seats must be lowered and locked in place with the lock pins.

(2) The tailgate must be lowered all the way down. Never allow troops to climb over the tailgate of any vehicle, this is unsafe.

(3) Load troops by way of the right side of the bed only to keep them away from the traffic side of the vehicle.

(4) After troops are loaded, secure the tailgate and ensure the troop safety strap is hooked across the back of the vehicle for their safety.

(5) Instruct the troops to remain seated facing inboard on the troop seats only. Ensure they understand no one will ride on the tailgate or have feet or legs hanging over the tailgate.

(6) When driving the M1123, remember there are not any seat belts or rollover protection for the troops riding in the cargo bed. Use extreme caution when operating off road.

### DEFENSIVE AND SAFE DRIVING PRACTICES.

Safe driving requires two main skills. First, there are those skills which enable drivers to drive defensively, to avoid a crash in spite of driving errors of others. Secondly, you must practice the basic skills for operating a vehicle such as turning, passing, backing or parking.

a. Defensive Driving Skills. Some of the skills required for defensive driving are scanning, communicating with other drivers, adjusting speed, following distances, and adjusting to changing conditions.

(1) Scanning is the skill of constantly looking ahead, to the sides, and to the rear while maintaining your position in the lane. By doing this you will be aware of what is going on with other drivers and changing conditions. You will also avoid last second moves such as sudden stops and quick lane changes.

(2) Communicating with other drivers is letting other drivers know where your vehicle is and what your intentions are by using the headlights, brake lights, turn signals and emergency flashers. Remember, all military vehicles must be operated with the headlights on at all times in accordance with unit SOP.

(3) Adjusting speed is important as a vehicle operator especially when operating larger vehicles. Speed must be constantly adjusted due to changing speed limits, road and traffic conditions and weather. Except for emergencies, the maximum speed limit for a tactical vehicle is 45 mph.

(4) Maintaining a margin of safety is accomplished by adjusting your following distance between vehicles. When a driver makes a mistake, other drivers need time to react. The only way to be sure you will have enough time to react is by leaving plenty of space between your vehicle and the vehicles around you. That space becomes your margin of safety.

b. Basic Driving Skills. Most driving skills, other than driving forward in your lane, are grouped together under turning, stopping, passing, backing and parking.

(1) Turns are made only after slowing down, looking to make sure the movement is safe, and ensure there are no pedestrians or other vehicles in the line of the turn. Often times you will have to yield to other traffic or pedestrians before making the turns. Signals must be used well in advance of all turns to let all other traffic know your vehicles intentions.

(2) Stopping can also become very serious depending on how it is done. Give a signal to those behind by slowing down, tapping the brakes and using the turn signal to alert those behind of your intentions. Hundreds of accidents are reported annually involving rear end collisions, most of which could be avoided by slowing down, not following too close and by signaling for stops or lane changes.

(3) Passing is very serious business and must be done only in safe areas where passing is allowed. Never attempt to beat oncoming traffic while passing, it's better to wait than take a chance of endangering the lives of yourself or others just to get in front of one vehicle.

(4) Backing is more difficult because often times you cannot see behind you. Try to avoid backing if at all possible. When it is absolutely necessary to back your vehicle, always look behind the vehicle first, use a ground guide and back slowly. Never back up to a loading dock or structure until you are absolutely sure there is no person or obstacle between your vehicle and the dock. Sound the horn before all backing operations.

(5) Parking in military motor pools normally involves driving into the assigned parking space, but you will be required to park in other areas that place you in dangerous situations. Always set the parking brake, shut off the engine and chock the

rear wheels when parking. When leaving a parking space, first look to see that the traffic is clear, use your signal.

c. Special Driving Considerations. The law requires you to drive on the right side of the road, except in cases such as on one-way roads and when passing.

(1) If driving less than the posted speed limit on a multi-lane highway, you must drive in the right lane unless passing, turning left, or unless guided by signs.

(2) When driving on a divided highway, unless ready to turn left, you should not drive in the left lane at a speed much slower than other traffic.

(3) Adjust your speed to driving conditions. The condition of the vehicle's brakes and tires, the road conditions, the weather and your own condition determine how fast you should be traveling no matter what the posted speed limit reads.

(4) Slow down before entering curves so you do not have to brake while you are in the curve. Then, as rounding the curve, gradually increase the acceleration enough to maintain a constant safe speed until leaving the curve. Stay on your own side of the road and as far to the right side of your lane as possible.

(5) Reduce the speed for turns also. For right turns, stay close to the right edge of the road, so another vehicle cannot get between your vehicle and the curb.

(6) When turning left, get as close to the center line as possible. Yield to oncoming traffic and also check their speed to ensure you can make the turn safely.

(7) Following too closely is one of the leading causes of accidents. Last year there were hundreds of accidents reported, caused by following too close. Leave yourself enough room to react to changing conditions and traffic.

(8) Intersections are another main accident area. The law requires you to slow down for intersections. The vehicle in an intersection has the right of way. If two vehicles arrive at the same time the one on the right has the right of way.

d. Road Signs. The road signs seen everywhere are coded by color and shape. It is a good idea to know these codes to act quickly and grasp the basic meaning or intent of the sign even before you have a chance to read it.

(1) Red means "STOP." It may also indicate that some movement is not allowed such as "DO NOT ENTER", "WRONG WAY", or "NO PARKING".

(2) Yellow indicates "CAUTION". Slow down and be careful when a yellow sign is seen. It may signal a railroad crossing ahead, a no passing zone, or some other potentially dangerous situation. Likewise, a yellow solid line painted on the road means no crossing or don't cross.

(3) Orange indicates road construction or maintenance. You'll want to slow down when you see an orange sign, as part of the road may be closed off or torn up. There may be workers and maintenance vehicles in the road also.

(4) Green is used to guide you. Green signs may indicate upcoming freeway exits or show the direction you should turn to reach a particular place.

e. Shape of Signs. The shape of road signs will tell you certain things you need to be aware of also.

(1) An octagon (eight sided) sign means “STOP”. It is always red with white letters.

(2) A diamond-shaped sign is a warning sign of something up ahead; for example: a curve, steep hill, soft shoulder, or narrow bridge.

(3) A triangle pointing down indicates “YIELD”. It assigns the right-of-way to traffic on certain approaches to intersections.

(4) A triangular sign also is used on two lane roads to indicate a no passing zone. This sign is placed on the left side of the road with the point of the triangle pointing toward the center of the road.

(5) Rectangular (square or oblong) signs show speed limits, parking regulations, and such information as distances to cities.

(6) There are many international road signs in use today. The basic message of many of these signs is in pictures or graphic symbols. A picture within a circle with a diagonal line across it shows what NOT to do.

f. Traffic Lights. We're all familiar with traffic lights or stoplights. Often green arrows are used in the lights for improved traffic control. On some multi-lane roads, green arrows light up, indicating that traffic in one or more lanes can move or make a turn. Green arrows don't mean "go no matter what." You'll still need to proceed with caution at these intersections, yielding right-of-way to pedestrians and sometimes to other traffic.

g. Pavement Marking. The road is also marked to guide you through certain situations.

(1) Two lane roads. The outer edges of any highway are normally marked with solid white lines. The center of the road will be marked with either yellow or white broken lines. A solid yellow line on either side of the center line means no passing in that lane.

(2) Multilane roads. Multilane roads are marked in many ways but are normally marked with white lines on each side and solid double yellow lines in the center to divide the road in each direction. Sometimes a center turn lane is provided with solid yellow lines on each side.

## REFERENCES

FM 21-305

TM 2320-10/6B